Docket No.: 281773US0X PCT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Kenichi ISHIKAWA, et al.

GROUP: 1794

SERIAL NO: 10/560,526

EXAMINER: Daniel MILLER

FILED: December 13, 2005

FOR: ACTIVATED CARBON PRODUCT IN SHEET FORM AND ELEMENT OF DEVICE FOR PREVENTING TRANSPIRATION OF FUEL VAPOR

DECLARATION UNDER 37 C.F.R. § 1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

Sir:

I, Kenichi ISHIKAWA, state:

1. That I am a citizen of Japan, residing at 3-11-10, Shiraniwadai, Ikoma, Nara, Japan.

2. That I am a co-inventor in the above-identified application.

3. That I graduated from a Master Course in Physics, Kyusyu University in March 1991.

4. That I joined Kuraray Co., Ltd. in April, 1991, and have been engaged in the development of activated carbon.

5. The following experiments were performed by me or under my supervision.

6. I have read and understood Susumu et al. (JP 2001-240407).

7. Susumu et al. describe an activated carbon capable of efficiently adsorbing small molecular weight materials such as hydrogen and nitrogen and a method of a carbon activation (see page 1). The Susumu et al. method comprises activating carbon at 600-1200 °C under an atmosphere that contains carbon dioxide and carbon monoxide (see abstract and [0008]-[0009], [0012]-[0013], [0019], Table 1, the Examples). The Susumu et al. method provides for a uniform small pore diameter of the activated carbon for adsorbing the small

molecular matter efficiently (see page 1, Problems to be Solved; and [0007]-[0008], [0012]-[0013], [0017]). The surface area of the activated carbon is 500-3000 m^2/g (see [0007], [0017], Table 1) and the adsorption quantity of nitrogen is 10 ml/g or more at 25 °C and 1 atm (see [0007], [0017], Table 1).

8. Our invention is directed to an element comprising a honeycomb-shaped activated carbon paper having an activated carbon that can adsorb and desorb gasoline vapors and satisfying b/a = 0.3 through 0.55. The honeycomb-shaped activated carbon paper of the invention reduces the leak amount of fuel vapor, provides a low pressure drop (increase in the pressure drop results in lengthening the fuel feeding period) and excellent moldability and strength. To achieve these characteristics, the activated carbon has to possess an excellent adsorption and desorption property, which is achieved by using the activation method of the invetion providing the ratio of b/a from 0.3 to 0.55, and a honeycomb-shaped activated carbon paper.

9. The following experiments demonstrate that the Susumu et al. activated carbon products do not necessarily have a b/a ratio within a range of 0.3 through 0.55.

10. As Susumu et al. do not describe an activation time, we have used an experimental analogous of Examples 1, 4, 8, and 14 and Comparative Examples 1, 3, 8, and 15 of Susumu et al. with regard to a reference to the specific area and the absorption quantity of N_2 described by Susumu et al.

11. Experimental data:

Experiments 1 to 4:

A phenol resin containing not more than 0.5% by weight of alkali metal was carbonized at 600°C. The carbonized phenol resin was pulverized to particle diameter of 1 to 3 mm. Then, the pulverized carbonized phenol resin was put in a batch-wise fluidized activation furnace and activated under an atmosphere that contains 40 vol.% of carbon dioxide and 4 mol.% of carbon monoxide at 900°C for 7 hours (Experiment 1) and at 900°C for 10 hours (Experiment 2).

The pulverized carbonized phenol resin was activated under an atmosphere that contains only steam at 900°C for 4 hours (Experiment 3) and at 900°C for 8 hours (Experiment 4).

Experiments 5 to 6:

Activated carbon was prepared in the same way as described in Experiment 1 at 900°C for 3 hours (Experiment 5) and activated carbon was prepared in the same way as described in Experiment 3 at 900°C for 2.5 hours (Experiment 6) except that a coconut shell containing not more than 0.5% by weight of alkali metal was used as the carbon material.

Experiment 7:

Activated carbon was prepared in the same way as described in Experiment 1 at 900°C for 5 hours (Experiment 7) except that a palm shell containing not more than 0.5% by weight of alkali metal was used as the carbon material was used as the carbon material.

Experiment 8:

A palm shell containing not more than 0.5% by weight of alkali metal was carbonized at 600°C. The carbonized palm shell was activated at 900°C for 4 hours under an atmosphere that contains 30 vol.% of steam and 4 vol.% of carbon monoxide.

The results obtained are shown in the attached Table 1.

As shown in Table 1, the Susumu et al activated carbon product does not necessarily possess the claimed b/a ratio. Examples 1, 2, 5, and 7 show that if carbon is activated in the atmosphere of carbon dioxide and carbon monoxide, the ratio b/a is greater than that claimed. Examples 3, 4, 6, and 8 in the Declaration show that when carbon is activated by steam or steam and carbon monoxide, the ratio b/a is smaller than in Examples 1, 2, 5, and 7 but is still outside of the upper limit of the claimed range.

Table 1

	Material		Activation gas component (residual composition: N2)			Properties		
	Raw Material	Content of Na, K, Ca (wt%)	CO_2 (vol%)	H_2O (vol%)	CO (vol%)	Specific area (m^2/g)	Adsorption quantity of N2 (ml/g)	b/a
Exp. 1	Phenol resin	0.01	40	0	4	1110	12.6	0.712
Exp. 2	Phenol resin	0.01	40	0	4	3020	10.9	0.645
Exp. 3	Phenol resin	0.01	0	30	0	1090	9.5	0.656
Exp. 4	Phenol resin	0.01	0	30	0	2060	9.3	0.589
Exp. 5	Coconut shell	0.14	40	0	4	1030	10.9	0.645
Exp. 6	Coconut shell	0.88	0	30	0	1160	8.2	0.598
Exp. 7	Palm shell	0.15	40	0	4	1500	10.1	0.603
Exp. 8	Palm shell	0.64	0	30	4	1510	7.2	0.576

12. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Further deponent saith not.

K. Ishikawa

Kenichi ISHIKAWA

June 24, 2008

Date

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